FUNCTIONS

1. Determine the slope of the following lines:
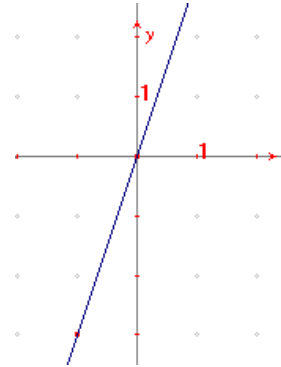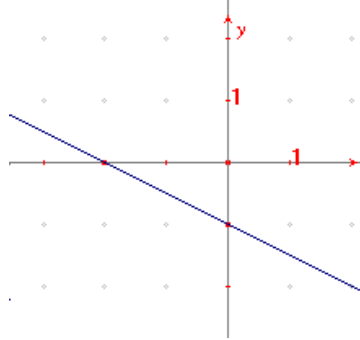
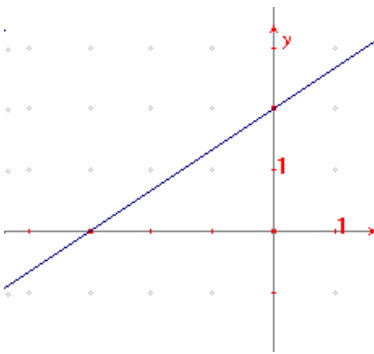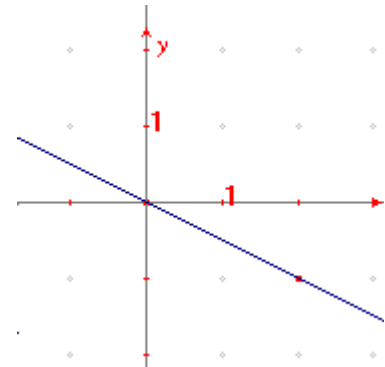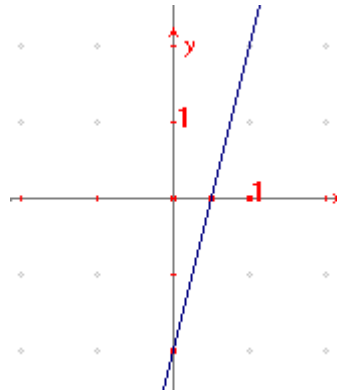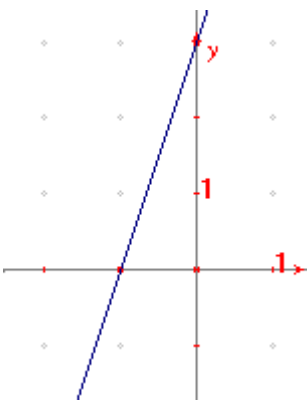2. Graph the line that contains the given information and find the equations.
   a) Slope = 2 Point (2,4)
   b) Slope = -1/2 Point (2,0)
   c) Slope = 1/3 Point (-2,1)
   d) Slope = -1 Point (2, -3)

3. Find the equation of the lines given by their graphs:

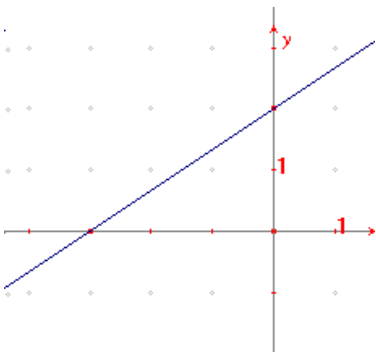4. Use the two points to find the equation of the line that goes through them both.

a) (2, 1) (5, -1)   b) (9, 8), (2, -6)

c) (2, -3), (1, -2)   d) (-4, 6) (2, 3)

5. A recipe for making ice cream requires 10 grams of vanilla for every 200 cm^3 of milk. Find the relationship between the quantity of milk and vanilla, and complete a graph representing the information.
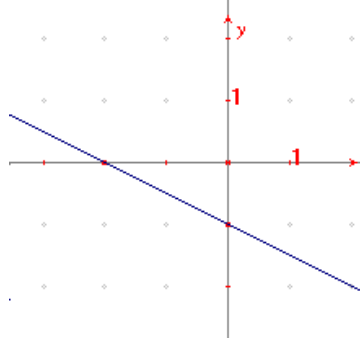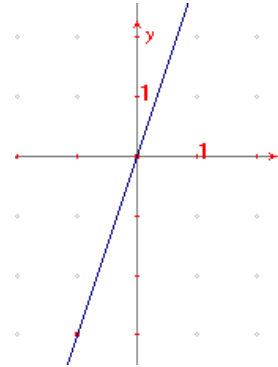
SOLUTION

1. Determine the slope of the following lines:
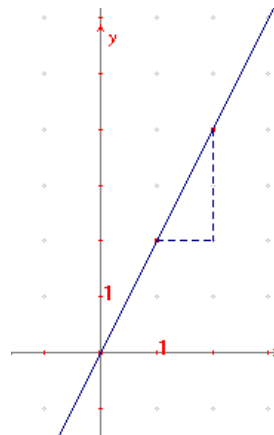
$$m = \frac{2}{3}$$

$$m = -\frac{1}{2}$$

$$m = 3$$
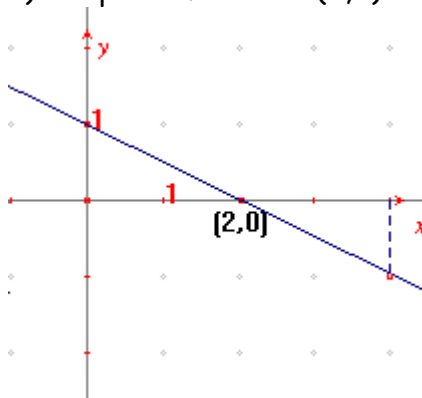
2. Graph the line that contains the given information and find the equations.

a) Slope = 2 Point (2,4)

$$y = m(x - x_0) + y_0$$
$$y = 2(x - 2) + 4$$
$$y = 2x - 4 + 4$$
$$y = 2x$$

b) Slope = -1/2 Point (2,0)

$$y = m(x - x_0) + y_0$$
$$y = -\frac{1}{2}(x - 2) + 0$$
$$y = -\frac{1}{2}x + 1$$

c) Slope = 1/3 Point (-2,1)

$$y = m(x - x_0) + y_0$$
$$y = \frac{1}{3}(x + 2) + 1$$
$$y = \frac{1}{3}x + \frac{2}{3} + 1$$
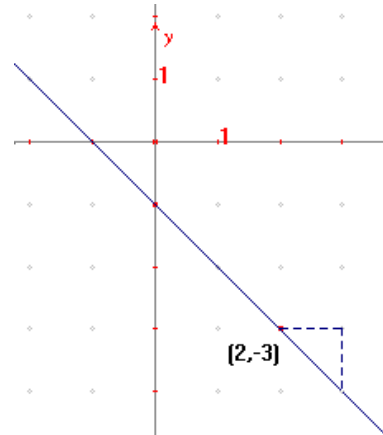$$y = \frac{1}{3}x + \frac{5}{3}$$
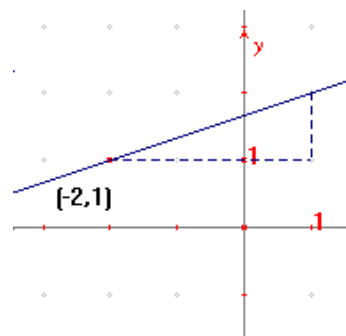
d) Slope = -1 Point (2, -3)
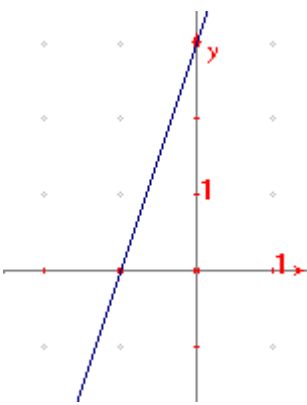
$$y = m(x - x_0) + y_0$$
$$y = -1(x - 2) - 3$$
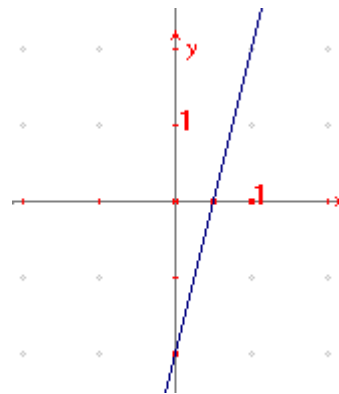$$y = -x + 2 - 3$$
$$y = -x - 1$$

[2,-3]

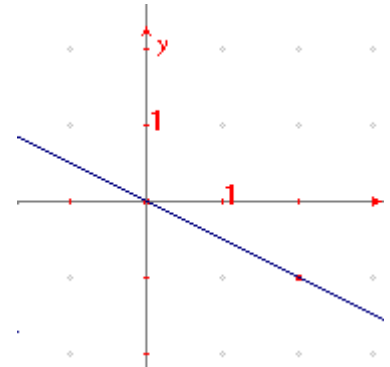3. Find the equation of the lines given by their graphs:

$$m = \frac{3}{1} = 3, n = 3$$

$$y = 3x + 3$$

$$m = \frac{2}{1} = 2, n = -2$$

$$y = 2x - 2$$

$$m = -\frac{1}{2}$$

$$y = -\frac{1}{2}x$$

4. Use the two points to find the equation of the line that goes through them both.

a) (2, 1) (5, -1) $m = \dfrac{-1-1}{5-2} = -\dfrac{2}{3} \rightarrow y = -\dfrac{2}{3}(x-2)+1 \rightarrow y = -\dfrac{2}{3}x + \dfrac{4}{3} + 1 \rightarrow y = -\dfrac{2}{3}x + \dfrac{7}{3}$

b) (9, 8), (2, -6) $m = \dfrac{-6-8}{9-2} = -2 \rightarrow y = -2(x-9)+8 \rightarrow y = -2x + 18 + 8 \rightarrow y = -2x + 26$

c) (2, -3), (1, -2) $m = \dfrac{-2+3}{1-2} = -\dfrac{1}{1} = -1 \rightarrow y = -1(x-2)-3 \rightarrow y = -x + 2 - 3 \rightarrow y = -x - 1$

d) (-4, 6) (2, 3) $m = \dfrac{3-6}{2+4} = -\dfrac{3}{6} = -\dfrac{1}{2} \rightarrow y = -\dfrac{1}{2}(x+4)+6 \rightarrow y = -\dfrac{1}{2}x - 2 + 6 \rightarrow y = -\dfrac{1}{2}x + 4$

5. A recipe for making ice cream requires 10 grams of vanilla for every 200 cm³ of milk. Find the relationship between the quantity of milk and vanilla, and complete a graph representing the information.

Vanilla (g)	10	20	30	40
Milk (cm³)	200	400	600	800

Formula $y = 20x$